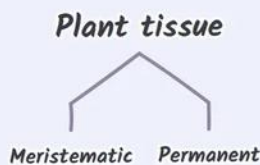


Plant Tissues and Anatomy

meristematic and permanent tissue, the three tissue systems, and the anatomy of root, stem and leaf

Tissue and Meristematic Tissue

- anatomy is the study of internal structure
- a tissue: similar or dissimilar cells sharing a common function and origin
- two groups by ability to divide: meristematic and permanent
- meristematic cells: young, living, able to divide; polyhedral or isodiametric, no intercellular spaces
- thin, elastic, cellulosic wall; dense protoplasm, distinct central nucleus
- tiny or absent vacuoles; high rate of metabolism



the one split every plant tissue falls on: still dividing, or not

Meristem by Origin

- promeristem (primordial/embryonic meristem): a minute area right at the root and shoot tips
- primary meristem: from the promeristem, at root and shoot apices, present from the start
- its dividing cells produce all the permanent tissues
- secondary meristem: develops later from living tissue that regains the ability to divide
- always lateral in position, e.g. fascicular, interfascicular, cork cambium

Meristem by Position *

- apical: growing point at root, shoot and branch tips; increases plant length
- apical is terminal in the shoot, sub-terminal (behind the root cap) in the root
- intercalary: base of an internode or a leaf; short lived, mainly active in monocots
- lateral: sides of the central axis; increases girth
- e.g. intrafascicular cambium in gymnosperm and dicot bundles

Meristem by Function

- protoderm: forms the protective covering, epidermis, around plant organs
- procambium: develops the primary vascular tissue
- ground meristem: builds cortex, endodermis, pericycle, medullary rays and pith
- meristem-derived parenchyma: distinct intercellular spaces, connected by plasmodesmata
- it can dedifferentiate back into vascular or cork cambium during secondary growth

Meristem, Three Classifications Side by Side

By origin	By position	By function
Promeristem	Apical	Protoderm
Primary meristem	Intercalary	Procambium
Secondary meristem	Lateral	Ground meristem

one meristematic cell is classified THREE separate ways at once, and a question can ask for any one of the three

